



General

Guideline Title

Guidelines for diagnosis, treatment, and use of laparoscopy for surgical problems during pregnancy.

Bibliographic Source(s)

Society of American Gastrointestinal and Endoscopic Surgeons (SAGES). Guidelines for diagnosis, treatment, and use of laparoscopy for surgical problems during pregnancy. Los Angeles (CA): Society of American Gastrointestinal and Endoscopic Surgeons (SAGES); 2011. 31 p. [185 references]

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Society of American Gastrointestinal and Endoscopic Surgeons (SAGES). Guidelines for diagnosis, treatment, and use of laparoscopy for surgical problems during pregnancy. Los Angeles (CA): Society of American Gastrointestinal and Endoscopic Surgeons (SAGES); 2007 Sep. 25 p. [178 references]

Recommendations

Major Recommendations

Quality of evidence (high, moderate, low, and very low) and grades of recommendations (strong and weak) are defined at the end of the "Major Recommendations" field.

Diagnosis and Workup

Imaging Techniques

Ultrasound

Guideline 1: Ultrasonographic imaging during pregnancy is safe and useful in identifying the etiology of acute abdominal pain in the pregnant patient (Moderate; Strong).

Risk of Ionizing Radiation

Guideline 2: Expeditious and accurate diagnosis should take precedence over concerns for ionizing radiation. Cumulative radiation dosage should be limited to 5-10 rads during pregnancy (Moderate; Strong).

Computed Tomography (CT)

Guideline 3: Contemporary multidetector CT protocols deliver a low radiation dose and may be used judiciously during pregnancy (Moderate; Weak).

Magnetic Resonance (MR) Imaging

Guideline 4: MR imaging without the use of intravenous gadolinium can be performed at any stage of pregnancy (Low; Strong).

Nuclear Medicine

Guideline 5: Administration of radionuclides for diagnostic studies is generally safe for mother and fetus (Low; Weak).

Cholangiography

Guideline 6: Intraoperative and endoscopic cholangiography exposes the mother and fetus to minimal radiation and may be used selectively during pregnancy. The lower abdomen should be shielded when performing cholangiography during pregnancy to decrease the radiation exposure to the fetus (Low; Weak).

Surgical Techniques

Guideline 7: Diagnostic laparoscopy is safe and effective when used selectively in the workup and treatment of acute abdominal processes in pregnancy (Moderate; Strong).

Patient Selection

Pre-operative Decision Making

Guideline 8: Laparoscopic treatment of acute abdominal disease has the same indications in pregnant and non-pregnant patients (Moderate; Strong).

Laparoscopy and Trimester of Pregnancy

Guideline 9: Laparoscopy can be safely performed during any trimester of pregnancy (Moderate; Strong).

Treatment

Patient Positioning

Guideline 10: Gravid patients should be placed in the left lateral decubitus position to minimize compression of the vena cava (Moderate; Strong).

Initial Port Placement

Guideline 11: Initial abdominal access can be safely accomplished with an open (Hasson) technique, Verres needle, or optical trocar, if the location is adjusted according to fundal height and previous incisions (Moderate; Strong).

Insufflation Pressure

Guideline 12: Carbon dioxide (CO₂) insufflation of 10-15 mm Hg can be safely used for laparoscopy in the pregnant patient. (Moderate; Strong).

Intraoperative CO₂ Monitoring

Guideline 13: Intraoperative CO₂ monitoring by capnography should be used during laparoscopy in the pregnant patient (Moderate; Strong).

Venous Thromboembolic (VTE) Prophylaxis

Guideline 14: Intraoperative and postoperative pneumatic compression devices and early postoperative ambulation are recommended prophylaxis for deep venous thrombosis in the gravid patient (Moderate; Strong).

Gallbladder Disease

Guideline 15: Laparoscopic cholecystectomy is the treatment of choice in the pregnant patient with gallbladder disease regardless of trimester (Moderate; Strong).

Choledocholithiasis

Guideline 16: Choledocholithiasis during pregnancy may be managed with preoperative endoscopic retrograde cholangiopancreatography (ERCP) with sphincterotomy followed by laparoscopic cholecystectomy, laparoscopic common bile duct exploration, or post-operative ERCP (Moderate; Strong).

Laparoscopic Appendectomy

Guideline 17: Laparoscopic appendectomy may be performed safely in pregnant patients with appendicitis (Moderate; Strong).

Solid Organ Resection

Guideline 18: Laparoscopic adrenalectomy, nephrectomy and splenectomy are safe procedures in pregnant patients (Low; Weak).

Adnexal Masses

Guideline 19: Laparoscopy is safe and effective treatment in gravid patients with symptomatic ovarian cystic masses. Observation is acceptable for all other cystic lesions provided ultrasound is not concerning for malignancy and tumor markers are normal. Initial observation is warranted for most cystic lesions <6 cm in size (Low; Strong).

Adnexal Torsion

Guideline 20: Laparoscopy is recommended for both diagnosis and treatment of adnexal torsion unless clinical severity warrants laparotomy (Low; Strong).

Perioperative Care

Fetal Heart Monitoring

Guideline 21: Fetal heart monitoring should occur preoperatively and postoperatively in the setting of urgent abdominal surgery during pregnancy (Moderate; Strong).

Obstetrical Consultation

Guideline 22: Obstetric consultation can be obtained pre- and/or postoperatively based on the severity of the patient's disease, gestational age, and availability of the consultant (Moderate; Strong).

Tocolytics

Guideline 23: Tocolytics should not be used prophylactically in pregnant women undergoing surgery but should be considered perioperatively when signs of preterm labor are present (High; Strong).

Definitions:

Grading of Recommendations Assessment, Development and Evaluation (GRADE) System for Rating the Quality of Evidence

High quality - Further research is very unlikely to alter confidence in the estimate of impact

Moderate quality - Further research is likely to alter confidence in the estimate of impact and may change the estimate

Low quality - Further research is very likely to alter confidence in the estimate of impact and is likely to change the estimate

Very low quality - Any estimate of impact is uncertain

GRADE System for Recommendations Based on the Quality of Evidence

Strong - It is very certain that benefit exceeds risk for the option considered

Weak - Risk and benefit well balanced, patients in differing clinical situations would make different choices, or benefits available but not certain

Adapted from Guyatt GH, Oxman AD, Vist GE, et al; GRADE Working Group. GRADE: An emerging consensus on rating quality of evidence and strength of recommendations. BMJ 2008;336:924-6.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Abdominal surgical emergencies in pregnant women for whom laparoscopy is indicated, including:

- Acute appendicitis
- Cholecystitis
- Intestinal obstruction
- Ovarian cysts, masses, or torsion
- Symptomatic cholelithiasis
- Adrenal tumors
- Splenic disorders
- Symptomatic hernias
- Complications of inflammatory bowel diseases
- Abdominal pain of unknown etiology

Guideline Category

Assessment of Therapeutic Effectiveness

Diagnosis

Management

Risk Assessment

Treatment

Clinical Specialty

Gastroenterology

Nuclear Medicine

Obstetrics and Gynecology

Radiology

Surgery

Intended Users

Physician Assistants

Physicians

Guideline Objective(s)

To provide specific recommendations and guidelines to assist physicians in the diagnostic work-up and treatment of surgical problems in pregnant patients focusing on the use of laparoscopy

Target Population

Pregnant women who require abdominal procedures that would normally be done laparoscopically

Interventions and Practices Considered

Diagnosis

1. Ultrasound
2. Limiting doses of ionizing radiation
3. Computed tomography
4. Magnetic resonance (MR) imaging
5. Nuclear medicine (use of radiopharmaceuticals, including technetium-99m)
6. Cholangiography (including MR cholangiopancreatography [MRCP])
7. Endoscopic retrograde cholangiopancreatography (ERCP)
8. Intraoperative ultrasound
9. Intraoperative choledochoscopy
10. Diagnostic laparoscopy

Patient Selection

1. Preoperative decision making
2. Use of laparoscopy during any trimester of pregnancy

Laparoscopic Management

1. Patient positioning
2. Initial port placement
3. Insufflation pressure
4. Intraoperative carbon dioxide monitoring by capnography
5. Venous thromboembolic prophylaxis (pneumatic compression devices, early ambulation, heparin)

Treatments/Management

1. Laparoscopic cholecystectomy
2. Preoperative ERCP with sphincterotomy
3. Laparoscopic common bile duct exploration
4. Postoperative ERCP
5. Laparoscopic appendectomy
6. Laparoscopic solid organ resection (adrenalectomy, nephrectomy, splenectomy)
7. Laparoscopic removal of adnexal mass
8. Laparoscopic detorsion or resection of adnexal torsion
9. Laparotomy

Perioperative Care

1. Fetal heart monitoring
2. Obstetrical consultation
3. Use of tocolytics

Major Outcomes Considered

Maternal and fetal morbidity and mortality
Complication rates

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

A systematic literature search using MEDLINE was performed in July 2010.

The following terms were used: pregnancy and laparoscopy, pregnancy and ionizing radiation, pregnancy and radiology, pregnancy and MRI, pregnancy and HIDA scan, pregnancy and nuclear medicine, pregnancy and cholangiography, pregnancy and abdominal access, pregnancy and CO2, pregnancy and cholecystectomy, pregnancy and appendicitis, pregnancy and adnexal mass, and tocolytics and surgery.

All pertinent articles were reviewed, including controlled trials, case series, and case reports. The bibliographies of relevant articles were searched for additional articles that may have been omitted in the initial literature search.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Grading of Recommendations Assessment, Development and Evaluation (GRADE) System for Rating the Quality of Evidence

High quality - Further research is very unlikely to alter confidence in the estimate of impact

Moderate quality - Further research is likely to alter confidence in the estimate of impact and may change the estimate

Low quality - Further research is very likely to alter confidence in the estimate of impact and is likely to change the estimate

Very low quality - Any estimate of impact is uncertain

Adapted from Guyatt GH, Oxman AD, Vist GE, et al; GRADE Working Group. GRADE: An emerging consensus on rating quality of evidence and strength of recommendations. BMJ 2008;336:924-6.

Methods Used to Analyze the Evidence

Systematic Review

Description of the Methods Used to Analyze the Evidence

Both the quality of the evidence and the strength of the recommendation for each of the guidelines were assessed according to the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system (see the "Rating Scheme for the Strength of the Evidence" and "Rating Scheme for the Strength of the Recommendations" fields).

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

Not stated

Rating Scheme for the Strength of the Recommendations

Grading of Recommendations Assessment, Development and Evaluation (GRADE) System for Recommendations Based on the Quality of Evidence

Strong - It is very certain that benefit exceeds risk for the option considered

Weak - Risk and benefit well balanced, patients in differing clinical situations would make different choices, or benefits available but not certain

Adapted from Guyatt GH, Oxman AD, Vist GE, et al; GRADE Working Group. GRADE: An emerging consensus on rating quality of evidence and strength of recommendations. BMJ 2008;336:924-6.

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

Internal Peer Review

Description of Method of Guideline Validation

This guideline was reviewed and approved by the Board of Governors of the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES), January 2011.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

There are many advantages of laparoscopy in the pregnant patient including decreased fetal respiratory depression due to diminished postoperative narcotic requirements, lower risk of wound complications, diminished postoperative maternal hypoventilation, shorter hospital stays, and decreased risks of thromboembolic events. The improved visualization in laparoscopy may reduce the risk of uterine irritability by decreasing the need for uterine manipulation. Decreased uterine irritability results in lower rates of spontaneous abortion and preterm delivery.

Potential Harms

- Significant radiation exposure may lead to chromosomal mutations, neurologic abnormalities, mental retardation, and increased risk of childhood leukemia. Fetal mortality is greatest when exposure occurs within the first week of conception. Exposure of the conceptus to 0.5 rad increases the risk of spontaneous abortion, major malformations, mental retardation, and childhood malignancy to one additional case in 6,000 above baseline risk.
- Endoscopic retrograde cholangiopancreatography (ERCP) carries risks beyond the radiation exposure such as bleeding and pancreatitis. In non-pregnant patients, the risk of bleeding is 1.3% and risk of pancreatitis is 3.5% to 11%.
- Because carbon dioxide (CO₂) exchange occurs with intraperitoneal insufflation there has been concern for deleterious effects to the fetus from pneumoperitoneum. Some animal studies have confirmed fetal acidosis with associated tachycardia, hypertension and hypercapnia during CO₂ pneumoperitoneum, while other animal studies contradict these findings. There are no data showing detrimental effects to human fetuses from CO₂ pneumoperitoneum.
- One recent study showed an odds ratio of 2.3 for fetal loss in laparoscopy compared to conventional surgery for appendicitis.

Qualifying Statements

Qualifying Statements

- Guidelines for clinical practice are intended to indicate preferable approaches to medical problems as established by experts in the field. These recommendations will be based on existing data or a consensus of expert opinion when little or no data are available. Guidelines are applicable to all physicians who address the clinical problem(s) without regard to specialty training or interests, and are intended to indicate the preferable, but not necessarily the only, acceptable approaches due to the complexity of the healthcare environment. Guidelines are intended to be flexible. Given the wide range of specifics in any health care problem, the surgeon must always choose the course best suited to the individual patient and the variables in existence at the moment of decision.
- The recommendations are considered valid at the time of guideline production based on the data available. Each guideline is scheduled for periodic review to allow incorporation of pertinent new developments in medical research knowledge and practice.
- More data have accumulated as laparoscopy has become more common during pregnancy. Most of the data are found in case series and retrospective reviews which limit the ability to provide absolute guidelines. Further controlled clinical studies are needed to clarify these guidelines, and revision may be necessary as new data appear.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

IOM Domain

Effectiveness

Safety

Identifying Information and Availability

Bibliographic Source(s)

Society of American Gastrointestinal and Endoscopic Surgeons (SAGES). Guidelines for diagnosis, treatment, and use of laparoscopy for surgical problems during pregnancy. Los Angeles (CA): Society of American Gastrointestinal and Endoscopic Surgeons (SAGES); 2011. 31 p. [185 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

1996 Feb (revised 2011)

Guideline Developer(s)

Society of American Gastrointestinal and Endoscopic Surgeons - Medical Specialty Society

Source(s) of Funding

Society of American Gastrointestinal Endoscopic Surgeons (SAGES)

Guideline Committee

Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) Guidelines Committee

Composition of Group That Authored the Guideline

Committee Members: Jonathan P. Pearl, MD; Raymond R. Price, MD; Ziad T. Awad, MD; Simon Bergman, MD; Ronald H. Clements, MD; David B. Earle, MD; David S. Edelman, MD; Liane S. Feldman, MD; Erika K. Fellingner, MD; Shannon A. Fraser, MD; Stephen P. Haggerty, MD; William W. Hope, MD; Ifeoma J. Igboeli, MD; Geoffrey P. Kohn, MD; Henry J. Lujan, MD; Lisa R. Martin Hawver, MD; Sumeet K. Mittal, MD; Erica A. Moran, MD; David W. Overby, MD; Kurt E. Roberts, MD; John S. Roth, MD; Alan A. Saber, MD; J. R. Salameh, MD; Dimitrios Stefanidis, MD; Andrew S. Wright, MD; Jin S. Yoo, MD; Joerg Zehetner, MD; Marc Zerey, MD; William S. Richardson, MD (*Co-Chair*); Robert D. Fanelli, MD, FACS (*Chair*)

Financial Disclosures/Conflicts of Interest

Society of American Gastrointestinal Endoscopic Surgeons (SAGES) leadership members, committee members, and guidelines authors disclose real and potential conflicts on a yearly basis and whenever they change, and real and potential conflicts are mitigated through mechanisms approved by the SAGES Conflict of Interest Task Force.

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Society of American Gastrointestinal and Endoscopic Surgeons (SAGES). Guidelines for diagnosis,

treatment, and use of laparoscopy for surgical problems during pregnancy. Los Angeles (CA): Society of American Gastrointestinal and Endoscopic Surgeons (SAGES); 2007 Sep. 25 p. [178 references]

Guideline Availability

Electronic copies: Available from the [Society of American Gastrointestinal Endoscopic Surgeons \(SAGES\) Web site](#) .

Print copies: Available from the Society American Gastrointestinal Endoscopic Surgeons (SAGES), 11300 W. Olympic Blvd., Suite 600, Los Angeles, CA 90064; Web site: www.sages.org .

Availability of Companion Documents

None available

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI Institute on December 11, 2007. The information was verified by the guideline developer on December 19, 2007. This summary was updated by ECRI Institute on March 11, 2011 following the U.S. Food and Drug Administration (FDA) advisory on Terbutaline. This summary was updated by ECRI Institute on July 18, 2011. The updated information was verified by the guideline developer on July 21, 2011.

Copyright Statement

This NGC summary is based on the original guideline, which is subject to the guideline developer's copyright restrictions.

Disclaimer

NGC Disclaimer

The National Guideline Clearinghouse^{â„¢} (NGC) does not develop, produce, approve, or endorse the guidelines represented on this site.

All guidelines summarized by NGC and hosted on our site are produced under the auspices of medical specialty societies, relevant professional associations, public or private organizations, other government agencies, health care organizations or plans, and similar entities.

Guidelines represented on the NGC Web site are submitted by guideline developers, and are screened solely to determine that they meet the NGC Inclusion Criteria which may be found at <http://www.guideline.gov/about/inclusion-criteria.aspx>.

NGC, AHRQ, and its contractor ECRI Institute make no warranties concerning the content or clinical efficacy or effectiveness of the clinical practice guidelines and related materials represented on this site. Moreover, the views and opinions of developers or authors of guidelines represented on this site do not necessarily state or reflect those of NGC, AHRQ, or its contractor ECRI Institute, and inclusion or hosting of guidelines in NGC may not be used for advertising or commercial endorsement purposes.

Readers with questions regarding guideline content are directed to contact the guideline developer.